

# Digital Bank of the Future

Lyubov Anatolyevna Petrova

FSFEI of HE (Federal State-Funded Educational Institution  
of Higher Education) "Penza State University"  
Penza, Russia

Tatyana Evgenievna Kuznetsova

FSFEI of HE "Penza State University"  
Penza, Russia

Sofya Anatolyevna Eremina

PJSC "Sberbank of Russia"  
Penza, Russia

Oleg Anatolyevich Kalachev

FSFEI of HE, Deputy Manager of Penza Department  
№ 8624 PJSC "Sberbank of Russia"

**Abstract**—In this article the authors express their opinion regarding digital transformation in the banking sector. Initially, it was stated that digital technologies open new opportunities for further development of the sector. Existing literature on this issue revealed the main approaches to the definition of digital transformation in the banking sector. The authors analyzed Russian and foreign digital technologies, implemented for planning, monitoring and evaluating management strategies, which enabled them to suggest priority areas for digital technology application as part of the further development of performance management. According to the analysis, digital bank transformation, contrary to the popular belief, is no alternative. Moreover, digital technologies resolve many problems identified in the past when mechanisms and tools for performance management had been implemented. Digital technologies shorten the time lag between results achievement and getting data on results, significantly increase the number of data sources and indicators that can be used for planning, monitoring and evaluating the productivity and efficiency of banking activities, reduce the risk of reported data being purposefully misrepresented.

The research objective is to define the concept of digital bank, identify problems and advantages of digital technologies in banking.

Theoretical and methodological basis of the research is the work of Russian and foreign scientists on banking sector problems in terms of digitalization. Ronald Coase's theory of uniting people into production cooperatives of any type holds a special place in this research. The following research methods have been used: modeling, analogy, historical analysis.

## I. INTRODUCTION

Digitalization is becoming an increasingly important mediator for processes and structural changes both in national economies and in the world economy. Digitalization is a global trend in all aspects of human activity and the banking sector is no exception [14, p. 23].

The definition of "digitalization" is converting information into digital form. However, in business, digitalization usually

refers to two types of changes in operating models. The first one is the transfer of communications to digital channels, the second is the automation of routine operations. These changes are closely interconnected as digitalization is impossible without establishing communication channels [9].

The evolution of these channels proves the above statement. ATM machines appeared in the 1970s, call centers in the 80s, mass Internet in the 90's and mobile technologies in the 2000s.

Historically, commercial banks have always had an extensive branch network. However, nowadays, each of these communication channels with the client is an addition to the branch network [2, p. 75].

In terms of digitalization, we observe a different type of channel, digital one. This channel is based on Internet technologies and is an online branch of the bank. In fact, digital communication channel can become a unified platform to all other ways of communication: mobile (via Internet) and physical (in the banking facility). This is the essence of the qualitative bank transformation, the emergence of a digital bank of the future. This means banks should shift from customer service channels to digital technology. Call centers, ATMs, online banking, mobile banking in the new technological paradigm will become elements of the digital world [23, p. 77].

Thus, the traditional physical banking facility is just a member of the banking system, not the key part of it as was previously the case. Using the digital platform, a bank will be able to change dramatically [15, p. 858].

## II. DIGITALIZATION OF BANKS OUTSIDE RUSSIA

The US Federal Reserve System carries out transactions using cheques, the methods date back to the recognition of the first banking charter in 1791. Outdated American payment system has many disadvantages [5, 28], such as limited

payment information, low calculating speed [3], lack of detailed information on customer transactions, high fees [26].

Even though the USA is not rushing to apply new technological capabilities, other countries, including England, Mexico and Australia, switched to faster payment technologies [17, p. 432].

There has been a rapid increase in digitalization in India and China, we observe a balanced substitution in Singapore and a gradual transition in Mexico [27, p. 103].

Meanwhile, almost all banks and many big countries are at an early stage of digitization, particularly Canada, Hong Kong, Indonesia [29, p. 3] and Germany [22, p. 65].

**III. DIGITALIZATION OF THE BANK OF RUSSIA**

Nowadays the flagship of digitalization in the banking system of Russia is Bank of Russia [4, p. 177]. Digital economy in Russia is being implemented according to the national program effective till January 1, 2035 (Figure 1).

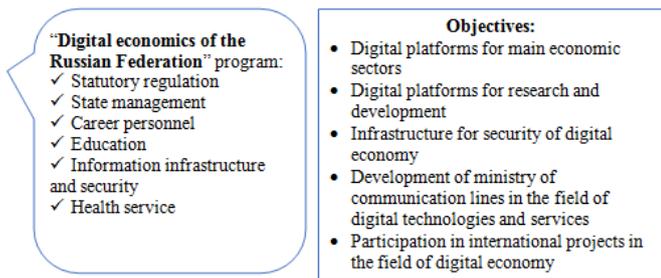


Fig. 1. Structure of the national program "Digital Economy of the Russian Federation" [1]

Bank of Russia is developing several projects in the digital economy (Figure 2), namely, updates based on Hyperledger technology, preliminary application of the Masterchain platform and other studies within the framework of "Digital Economy of the Russian Federation".

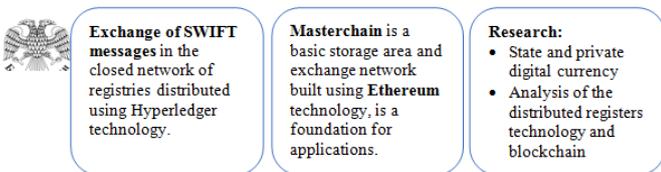


Fig. 2. Main projects of Bank of Russia

Together with IBM Bank of Russian is developing a prototype based on the principles of the blockchain using Hyperledger platform [9, p.127]. Leading companies in finance, banking, Internet of things, logistics, production and technology are involved in this international project such as London Stock Exchange, SWIFT, MICEX, IBM, Cisco, Intel, Sberbank etc. [18, p. 311]

Bank of Russia is also developing a platform "Masterchain", namely, Trusted Execution Environment for data exchange and control actions based on protocol modification Ethereum (Figure 3) [10, p. 43].

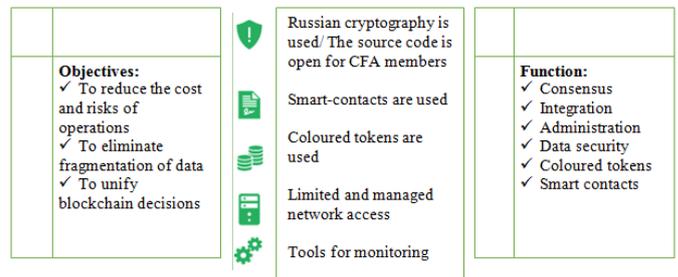


Fig. 3. Main goals, functions and capabilities of the Masterchain platform

In addition, Bank of Russia is conducting a series of studies regarding public and private digital currencies. According to the latest research, many modern cryptocurrencies may disappear in the next 5 years, they will be replaced by state cryptocurrency. Bank of England may become the first central bank to launch its own cryptocurrency [5]. Transferring currency to the blockchain will be beneficial because it makes using a larger range of monetary policy instruments possible; such financial system is safer and more transparent. Overall, it will lead to lower cost of financial services [21].

To conclude, Bank of Russia will regulate banking sector, financial market participants and identify violations through algorithmized information, regulations, provisions and decrees. Such approach will make it possible to shift from accepting standard financial statements from banking system participants to digital data processing [4, p, 203].

**IV. DIGITALIZATION OF COMMERCIAL BANKS IN RUSSIA**

Predicting the future is difficult, but it is possible to outline the economic essence of banking services and analyze the trends that have formed within it.

The theory of Ronald Coase, a Nobel laureate in economics in 1991, who investigated the nature of people uniting into production cooperatives of any type, will help us with this [2, p.23]. He investigated why newspapers are published by publishing companies where authors, editors and typesetters work full-time, even though they could sell their work independently. Coase claimed that the matter was transaction costs, inconvenience associated with organizing collective work in a free market. Another important reason for uniting service providers into an organization has to do with economies of scale and synergies. All this applies to commercial banks as well.

Examples of economy of scale and synergies between different types of bank services are cross-selling and industry expert evaluation for risks assessment. However, nowadays, competition has intensified due to the specifics of banking products and services.

Such technological innovations as a blockchain, online banking, IoT, digital hygiene have a very high velocity which helps increase the products availability, make it easier to use as well as significantly reduce transaction costs.

Russian market includes such digital banks as Sberbank Online [10, p.61], Tinkoff Bank, Deutsche Bank, the Otkritie

financial group, which includes Rocketbank, one of the first Russian virtual banks, Tochka-Bank for entrepreneurs, which functions as an online business.

Thus, the 19-20 centuries were marked by tremendous successes of mankind, replacement of physical labor with machines, as for the 21st century, the main breakthrough will be replacing machines with intellectual labor.

According to the above, the definition of digital bank is the following.

A digital bank is a bank with products and services provided in digital form. At the same time, its clients daily communicate with the bank through mainly digital channels. Such bank's infrastructure is optimized for real-time digital interactions, and the corporate culture implies fast decision-making and technological changes.

## V. CONCLUSION

As a matter of fact, banking sector is modernizing, accepting new competing players, specialized in monoservices, services in separate areas of banking.

On the other hand, after the global financial crisis of 2008-2009 bank regulation are becoming more stringent every year.

These changes create certain problems for banks. Firstly, the implementation of regulatory requirements involves significant direct costs [13, p. 606]. Banks bear significant costs associated with the need to comply with constantly tightening regulation, which is a competitive advantage for new financial companies, that are less burdened by regulatory standards than traditional banks [25, p. 3]. Secondly, regulation destroys significant synergies between different areas of banking services.

In these conditions, introduction of digital technologies will significantly reduce bank's operating costs in two key areas and boost competitiveness:

- First, the transfer of communications to digital channels will reduce the cost of affiliate customer service.
- Second, automation of routine bank operations will result in fewer employees and reduced operating costs.

Therefore, the new digitalization trend will create winners and losers. The winners will be those who have a clear strategic vision, strive to analyze customers and implement digital technologies. Besides, the winners will actively influence customers and their culture. Finally, the winners will perceive digitization not as a violation of their activities, but as growth opportunity in terms of customer service and the segment overall.

## References

- [1] Blockchain: Scheme of the New Economy. Melanie Swan: [translation from English]. Moscow: Olympus-Business Publishing House, 224 p., 2016.
- [2] Yu.B. Bubnova, "Transformation of the business model of the bank in the conditions of the digital economy", News of the Baku State University, t. 29, no. 3, pp. 425-433, 2019.
- [3] N.V. Vashkelyuk and P.V. Trunin, Non-standard monetary policy measures: international experience and Russian practice. M.: Publishing House "Case" RANKHiGS, 110 p., 2016.
- [4] E.A. Brandeleva, Institutional economy: textbook. Moscow: KNORUS, 344 p., 2017.
- [5] Course on fintech: prospects of market development in Russi. Agency of Strategic Initiatives [Electronic resource]. Available at: <https://asi.ru/> (Accessed: 02.11.2019).
- [6] T.K. Ohanesyan and others, Digital Economy: Global Trends and Practice of Russian Business. M.: National Research University, 121 p., 2017.
- [7] Official website of Sberbank of Russia [Electronic resource]. Available at: <https://www.cbr.ru> (Accessed: 20.11.2019).
- [8] Official website of the Central Bank of the Russian Federation [Electronic resource]. Available at: <http://www.cbr.ru> (Accessed: 20.11.2019).
- [9] Program of digital economy development in the Russian Federation till 2035 [Electronic resource]. Available at: <https://www.static.government.ru> (Accessed: 02.11.2019).
- [10] A.M. Ruznyaev, "Digitisation of Russian banks as an inevitable requirement of the digital economy", Vector of the economy, no. 5 (23), p. 61, 2018.
- [11] E.V. Chaikina, "Digital Economy: New Opportunities for Banks", Economics and Management: Theory and Practice, t. 4, no. 4-1, pp. 43-49, 2018.
- [12] A. Murati, O. Skau, Z. Taraporevala and another, "Disruption in European consumer finance: Lessons from Sweden", Global Banking, 2018.
- [13] "Developing a digital banking framework in the Iranian banks: prerequisites and facilitators", International journal of e-business research, 14, 4, pp. 65-77.
- [14] E.P. Ermakova and E.E. Frolova, "Legal regulation of digital", Banking in Russia and foreign countries (european union, usa, prc), 4, 606-625, 2019.
- [15] Santosh Kumar Gupta and Anshika Bansal, "Young customer's attitude towards digital banking with special reference to pulic and private bank in uttrakhand", JIMS8M-the journal of indian management & strategy, 4, pp. 23-27, 2018.
- [16] A. Larsson and Y. Viitaoja, "Building customer loyalty in digital banking A study of bank staff's perspectives on the challenges of digital CRM and loyalty", International journal of bank marketing, 35, 6, pp. 858-877, 2017.
- [17] Cajetan I. Mbama and Patrick O. Ezepue, "Digital banking, customer experience and bank financial performance: UK customers' perceptions", International journal of bank marketing, 36, 2, pp. 230-255, 2018.
- [18] C.I. Mbama, P. Ezepue, L. Alboul, and et al., "Digital banking, customer experience and financial performance: UK bank managers' perceptions", Journal of research in interactive marketing, 12, 4, pp. 432-451, 2018.
- [19] A. Megargel, V. Shankaraman, and S.K Reddy, "Real-time inbound marketing: a use case for digital banking", Academic press ltd-elsevier science LTD, pp. 311-328, 2018.
- [20] M. Murphy, Becoming a digital bank. McKinsey & Company, 2016.
- [21] C. Moeckel, "From user-centred design to security: building attacker personas for digital banking", Proceedings of the 10th Nordic conference on human-computer interaction, pp. 892-897, 2018.
- [22] M. Mujinga, M.M. Eloff, and J.H. Kroeze, "System usability scale evaluation of online banking services: A South African study", South African journal of science, 114, pp. 3-4, 2018.
- [23] N. Pourebrahimi, A. Kordnaeij, H.K. Hosseini, and et al., 2018.
- [24] A.A. Shaikh and H. Karjaluto, Marketing and Mobile Financial Services: A Global Perspective on Digital Banking Consumer

- Behavior. Book Series: Rutledge Studies in Marketing, pp. 1-295, 2019.
- [25] A.A. Shaikh, R. Glavee-Geo, and H. Karjaluoto, "Exploring the nexus between financial sector reforms and the emergence of digital banking culture – Evidences from a developing country", *Research in international business and finance*, 42, pp. 1030-1039, 2018.
- [26] A.A. Shaikh and H. Karjaluoto, "On some misconceptions concerning digital banking and alternative delivery channels", *International journal of e-business research*, 12, 3, pp. 1-16, 2016.
- [27] Y. Son, H.E. Kwon, and G.K. Tayi, "Impact of customers' digital banking adoption on hidden defection: A combined analytical-empirical approach", *Journal of operations management IEEE*, 2019. DOI: 10.1002/joom.1066.
- [28] Ahmad Iqbal Hakim Suhaimi and Mohd Shahrulnizam bin Abu Hassan, "Determinants of branchless digital banking acceptance among generation y in Malaysia", *Conference: IEEE Conference on e-Learning, e-Management and e-Services*, pp. 103-108, 2018.
- [29] F. Trevisan, B. Bello, and M. Vaughan, "Mobilizing personal narratives: The rise of digital "story banking" in U.S. grassroots advocacy", *Journal of information technology & politics IEEE*, 2019. DOI: 10.1080/19331681.2019.1705221.
- [30] J. Vong, P. Mandal, and I. Song, Insu, "Digital banking for alleviating rural poverty in Indonesia: some evidences", *Smart technologies for smart nations: perspectives from the asia-pacific region*, pp. 3-18, 2016.